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ABSTRACT

The progress of the child survival and development revolution (CSDR) from 1983 through 1986 is reviewed. The concept of the CSDR was first proposed in 1982 as a response to the need for low-cost, high-impact child health care measures during the global recession of the early 1980s. The report begins with a brief description of the relevance of the CSDR approach as an alternative cost-effective means of preserving child health and promoting child development. Chapter I provides an overview of the development of the CSDR interventions as part of the basic services strategy and primary health care. Chapter II describes the contributions of CSDR to the generation of political will, social mobilization, the establishment of program linkages, and increased international cooperation on behalf of children. The major components of CSDR are detailed and their experiences are analyzed in chapter III. Chapter IV covers future trends. Tables and figures are included. (RH)

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Progress review

of the child survival and development revolution 1983-1986

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Progress review

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POLICY REVIEW

1987-1

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Progress review of the child survival and development revolution 1983-1986

POLICY REVIEW

Summary

This paper was prepared in response to the request of the 1985 Executive Board to review the experience gained to date of the child survival and development revolution (CSDR).

The report begins with a brief description of the relevance of the CSDR approach as an alternative low-cost and cost-effective means of preserving child health and promoting child development during this period of global recession and consequent economic readjustment. These new opportunities have created a moral imperative to act. Chapter I provides an overview of the development of the CSDR interventions as part of the basic services strategy and primary health care (PHC). Chapter II describes the contributions of CSDR to the generation of political will, social mobilization, the establishment of programme linkages and increased international co-operation on behalf of children. The major components of CSDR are detailed and their experiences are analysed in chapter III. Chapter IV reviews future trends.

Policy and strategy development

Developed within the context of primary health care (PHC) and growing out of the experience gained in applying the basic services strategy in the 1970s, the concept of the child survival and development revolution (CSDR) was first proposed in *The State of the World's Children* report in December 1982 as a response to the need for low-cost, high-impact measures during the global recession of the early 1980s. Consisting of a group of interventions aimed specifically at the significant improvement of child health, with the consequent reduction in infant and child deaths, the CSDR strategy is particularly relevant at a time when some countries are trying to readjust their economies in ways which take account of basic human needs, because it provides alternative low-cost and cost-effective means of preserving child health and promoting child survival through the reallocation of resources.

Its elaboration was facilitated by a new awareness that most infant and child deaths have a limited number of causes which can be prevented or remedied in large part by empowering parents with greater knowledge. Moreover, past developmental progress has created a major new potential for social mobilization and programme communication which can significantly reduce infant and young child death rates and improve child development at low financial cost per capita without waiting for progress in economic development. The new, improved or rediscovered low-cost health technologies represented by the package of CSDR interventions, their mass applicability and the recognition of the significance of the new, underused and growing communication capacity to reach into every home, make this possible over a 10- to 15-year period, with major progress potentially achievable by 1990.

In 1983, the UNICEF Executive Board adopted the CSDR strategy, which was later endorsed by the United Nations General Assembly, scores of Heads of State and Government and various international agencies. The World Bank, the United Nations Development Programme (UNDP), the World Health Organization (WHO), UNICEF and The Rockefeller Foundation took the lead to form the Task Force

for Child Survival in 1984. Several bilateral agencies, including those of Canada, Denmark, Italy, Norway, Sweden and the United States of America, the European Economic Community (EEC), and a wide range of non-governmental organizations (NGOs), professional societies and people's movements are now supporting CSDR in various countries on a significant scale. CSDR is demonstrating that the strategy can make a major contribution to the goal of 'Health for All by the Year 2000', first articulated jointly by WHO and UNICEF at Alma Ata in 1978.

In 1983, the Executive Board endorsed the inclusion of infant mortality rates (IMR) as a criterion in resource allocation and also established the Infant Mortality Reduction Reserve Fund to provide UNICEF with the flexibility to respond rapidly to emerging opportunities for accelerating the reduction of infant and child mortality through CSD programmes in developing countries.

The CSDR strategy integrates the growing potential in developing countries for social mobilization and communication with significant low-cost technological advances in growth monitoring, oral rehydration therapy (ORT), breast-feeding and good weaning practices, immunization, food supplementation (family food security), family (birth) spacing and female education. The programmes are, however, flexibly developed in order to meet the priority epidemiological needs of each country. They are thus able, wherever relevant, to include programmes on acute respiratory infections (ARI), malaria, maternal nutrition, vitamin A and other micronutrient deficiencies, and support for systems of essential drug supply. The experience has been varied, with many countries emphasizing immunization and ORT.

Utilizing past experience, the CSDR strategy recognizes the importance of generating political will at the highest level and of 'going to scale' to reach national coverage through the extensive use of communication channels to mobilize the society for the prevention of unnecessary and avoidable infant and child deaths and disabilities. The major emphasis is on empowering parents, particularly mothers, with knowledge of self-help in CSD techniques, and creating an increasing demand for low-cost services to meet the needs of their children.

In the development, implementation and monitoring/evaluation of programmes, UNICEF works closely with WHO and several major bilateral agencies that also have large child survival programmes.

UNICEF, together with WHO, has issued joint statements during the last three years on planning principles for accelerating immunization activities (1985), management of diarrhoea and use of ORT (1983, revised 1985), basic principles for the control of malaria and general guidelines for UNICEF/WHO support (1985), basic principles for the control of ARI in children in developing countries (1986) and maternal care for the reduction of perinatal and neonatal mortality (1986).

Sustainability of CSDR interventions has always been an important concern, but awareness of its crucial importance has led to greater efforts to incorporate it as a standard and routine consideration during the planning process. The significance of programme linkages was recognized at an early stage, and such linkages have been incorporated wherever opportunities exist. These and other related issues are discussed below.

In the past, it could be argued that there was little point in focusing public attention on the 'silent' emergency that resulted in the deaths of 40,000 children every day, because of the need to wait for economic and social development. Today, that perception is simply out of date because of recent improvements in knowledge and in the social organization to put that knowledge to use. These new opportunities mean that the 'silent' emergency has become as unacceptable as the 'loud'. The time has come to put an end to the mass deaths of children, along with slavery, racism and *apartheid*, for they are no longer acceptable to mankind. Such a change in ethics is fundamental in creating the moral context for action to benefit suffering children.

It is equally important to recognize the potential of utilizing the CSDR approach in the larger field of development. In the remaining years of the century, this contribution to the wider fight against poverty, stemming directly from experiences gained from CSDR, may prove to be of great significance.

Contributions of the child survival and development revolution

Even within the short time-span of four years, it has become evident that CSDR has made four significant contributions to development thinking and practice, viz.: (a) generation of political will; (b) social mobilization for 'going to scale'; (c) the emergence of stronger programme linkages; and (d) international co-operation for children.

1. Generation of political will

Although the generation of political will has been long acknowledged to be necessary for the successful implementation of the PHC approach, until recently, expressions of support have often not been translated into concrete and widespread action. The most pronounced result of CSDR is probably the elevation of public health and child health into the political arena, where these issues have received the attention of national leaders, decision makers and opinion makers and where implementation will undoubtedly be reflected in the future allocation and mobilization of financial, material and human resources—the best possible insurance for sustained action. A major and indispensable benefit of political commitment has been the facilitation of multisectoral co-operation for child health actions.

CSDR has also had a significant impact on the allocation of and support for bilateral-aid funding for development co-operation. For example, in the mid-1980s, the Government of the United States has allocated increased aid for health purposes, and public and congressional support for increased appropriations has been noteworthy.

2. Social mobilization for 'going to scale'

It is rare that development programmes and projects reach a scale covering the whole country. CSDR has been able to achieve these goals through social mobilization, which not only promotes the

generation of political will at the national level, but also advertises the feasibility and value of a given intervention among potential partners, including donors and NGOs.

In order to achieve nation-wide coverage despite all the constraints normally prevailing in developing countries (e.g. lack of resources, infrastructure, understanding, communications, etc.), a revolution in thinking had to take place. Constraints previously defined as insurmountable had to be redefined as amenable to policy interventions. This has become possible by increasing the number of participants to be involved in, for example, immunization and oral rehydration campaigns, beyond the health ministry to all sectors of society—the civil administration, the private sector, NGOs, trade unions, religious organizations, the media, the community and parents themselves.

The impact of the collective experience of a nation engaged in a successful endeavour to attain nation-wide coverage in a CSDR-generated health campaign has not yet been fully analysed. Preliminary analysis indicates that it may well enhance national feelings of self-reliance and political self-confidence, providing a sense of achievement against heavy odds. This can boost the expansion of other activities.

At the administrative level in many countries, accelerated immunization programmes represent the first experience of partnership in health involving intersectoral co-operation between many ministries, as well as between private voluntary and religious organizations, at all levels of society. In the process, the various participants have gained valuable experience in working together, and lessons in financial administration and other areas have been learned. These lessons can be transposed to other development activities which also require a vast and complex degree of organization to achieve nation-wide coverage.

In addition, the process has empowered parents and the people. Years of health education disseminated by few and scattered health educators are now being endorsed and legitimized by authority figures at all levels and through many communications channels. The concept of prevention embodied in immunization can thus not only lead to a demand by parents for immunization to protect their children's lives, but pave the way for other life-saving measures which they can implement themselves. Other interventions, such as ORT and growth monitoring, mutually reinforce both the demand by parents

for death-averting measures and their confidence in being able to use the measures successfully.

3. Establishment or emergence of programme linkages

As CSDR programmes succeed, there is a noticeable increase in their popular demand, and obvious political advantages accrue. As a result, programme linkages to sustain and deepen their impact have generally emerged over time. In several countries, a successful immunization campaign has led to the establishment of PHC structures (e.g. Burkina Faso), or to strengthening them and broadening their conceptual scope (e.g. Algeria, Colombia and Turkey), linking CSDR interventions with other sectors such as education and water supply and sanitation.

In Burkina Faso, the need to retain the gains made in the 'Vaccination Commando' campaign has led to the establishment of PHC structures in all villages (reaching 6,500 out of 7,500 villages, each with two community health workers, in 1986). Colombia has not only reinforced its health care system to put into effect a CSD plan incorporating a broad range of maternal and child health (MCH) and nutrition interventions, but is strengthening the role of health education in school curricula. Before graduation, all secondary students have to give 100 hours in support of community health services.

Many successful control of diarrhoeal diseases (CDD) programmes now also link ORT with water supply and sanitation, measles immunization, breast-feeding, food hygiene and personal hygiene, and often use the same social community structures that have successfully launched accelerated campaigns for expanded programmes on immunization (EPI), as in Nigeria. In some countries, the reverse has been the case. For example, EPI campaigns in Egypt have used structures established by the CDD programme. In a growing number of countries, the value of CSDR interventions is being taught in the school classroom. These programme linkages are healthy developments that need to be encouraged and further strengthened.

4. International co-operation for children

A major outcome of CSDR has been the unprecedented and growing commitment to international co-operation for child health and

survival. UNICEF has worked closely with several agencies of the United Nations system, including WHO, UNDP and the World Bank, as well as with international NGOs such as the International Pediatrics Association (IPA), the World Federation of Public Health Associations, the League of Red Cross and Red Crescent Societies and Rotary International. Other partners include the bilateral aid agencies of Canada, Denmark, France, Italy, Norway, Sweden and the United States; religious organizations; foundations; and regional organizations such as EEC.

In March 1984, 34 world leaders participated in a conference sponsored by The Rockefeller Foundation, WHO, UNDP, the World Bank and UNICEF in Bellagio, Italy to consider how the health of the world's children could be better protected. At that meeting, the formation of the Task Force for Child Survival, consisting of representatives from the five sponsoring agencies, was proposed and endorsed. The Task Force's initial mandate focused on accelerating immunization activities in a number of countries, identifying applied research needs in the field of immunization, and mobilizing external resources for national immunization programmes. At the Second Conference on Protecting the World's Children, held in Cartagena, Colombia, in October 1985, this mandate was further broadened to include CDD.

The Task Force has been increasingly concerned with unresolved technical issues in immunization and with promoting vaccine development. The focus is on the practical problems faced by national programmes in the management of immunization services and in the evaluation of their efficiency and effectiveness. The Task Force is expected to remain an important forum for exchanging information on immunization-related issues among interested bilateral and multilateral donors.

In 1985, Rotary International launched an extraordinary initiative called the 'Polio Plus' programme, pledging to provide all the polio vaccine necessary for up to five consecutive years for any participating city, state or country. As a part of 'Polio Plus', Rotary International also offered to provide technical assistance in planning, implementing and evaluating national immunization activities. To cover the costs of 'Polio Plus', Rotary International launched a campaign to raise US$120 million, primarily for the purchase of polio vaccine. By end-1986, Rotary had made 42 'Polio Plus' grants, representing a financial commitment of US$37.3 million.

Among bilateral agencies, the United States Agency for International Development (USAID) has established a Child Survival Fund and has adopted child survival as its programme thrust in health programmes. The Government of Italy has been the principal contributor to efforts to achieve universal child immunization (UCI) in 26 countries in Africa. The Government of Canada has supported child survival programmes and UCI efforts through its Commonwealth Fund and Special Fund for Francophone Countries in Africa, and has significantly increased allocations to child survival in its regular bilateral programmes.

IPA and its chapters have also adopted CSD as their programme thrusts. The Catholic Church has been instrumental in promoting CSDR in many countries, and the Catholic Bishops of Latin America recently met in Brazil to exchange their experiences of CSDR. The renowned University of Al Azhar in Cairo has also made a comprehensive study of the Holy Koran in support of CSDR.

Developments and analysis of experience

UNICEF CSDR experience since 1983 indicates that significant gains have been made in immunization, and substantial, although less significant, gains in the promotion of ORT. More modest progress has been made in promoting other CSDR interventions. It appears that the significant strides made in immunization may have been due in part to the challenge presented by the goal of UCI by 1990 (UCI/1990), adopted by the World Health Assembly (WHA) in 1977. Although the goal appeared distant three years ago, it has now become a distinct possibility that is within the world community's grasp, and in 1985, the UNICEF Executive Board and the United Nations General Assembly affirmed the importance of a stepped-up effort to achieve it.

1. Immunization

With the conquest of smallpox in prospect, WHA established EPI in 1974. By the end of the decade, steady progress had been made, reaching a global coverage of about 20 per cent against the six diseases which earlier took the lives of more than 4.5 million children and crippled millions more. These diseases—tuberculosis, measles, poliomyelitis, diphtheria, pertussis and tetanus—still take the lives of some 3.5 million children annually.

Since the advent of CSDR, significant progress has been made in accelerating EPI programmes. Since 1984, a growing number of developing countries, now the great majority, have undertaken, or are in the process of planning, accelerated immunization programmes using a variety of approaches to mobilize their societies and to spread awareness of the value of immunization. These approaches include the proclamation of 'national immunization days' or 'weeks' (e.g. Brazil, Cameroon, Colombia, the Dominican Republic, Egypt, El Salvador, Senegal, and the Syrian Arab Republic); 'pulse' campaigns which attempt to cover all susceptible children in a very concentrated period of time (e.g. Burkina Faso and Turkey); centrifugal expansion of district immunization efforts involving several sectors (e.g.

Bangladesh, China, India, Nigeria and Zaire); and the initiation of activities in urban areas, leading later to rural areas (e.g. Ethiopia, Nepal, Somalia and Zimbabwe, and most countries with difficult terrain).

An accelerated national EPI strategy generally has the following key objectives:

(a) Availability of immunization against the six EPI target diseases for all children by 1990, and full immunization of at least 75 to 85 per cent of children against each target disease;

TABLE 1

Countries undertaking acceleration of expanded programmes on immunization

REGION	1984	1985	1986	1987
AFRICA	Burkina Faso Nigeria	Ethiopia Somalia Uganda Zimbabwe	Angola Benin Botswana Burundi Cameroon Cape Verde Chad Congo Côte d'Ivoire Gambia Ghana Guinea-Bissau Kenya Lesotho Liberia Madagascar Malawi Mali Mauritania Mozambique Rwanda Sao Tome and Principe Senegal Sierra Leone Swaziland Togo United Rep. of Tanzania Zaire Zambia	Central African Rep. Comoros Equatorial Guinea Gabon Guinea Niger

(b) Strengthening the existing EPI infrastructures;

(c) Enlistment of all available communications and advocacy methods of stimulating demand for immunization, leading to the mobilization of the whole society;

(d) Use of campaign methodology for EPI acceleration efforts, not as a substitute for sustainable, long-term immunization programmes;

(e) Use of the immunization programme itself as a 'cutting edge' for advancing progress towards comprehensive PHC.

TABLE 1

Countries undertaking acceleration of expanded programmes on immunization

REGION	1984	1985	1986	1987
AMERICAS	Bolivia Brazil Colombia Costa Rica Dominican Rep. Nicaragua	Ecuador El Salvador Honduras Paraguay Peru	Belize Guatemala Mexico	
ASIA	Maldives Pakistan Sri Lanka Thailand	China India	Bangladesh Bhutan Burma Indonesia Kampuchea Nepal Viet Nam	
MIDDLE EAST AND NORTH AFRICA	Iran	Iraq Sudan Turkey	Algeria Democratic Yemen Djibouti Egypt Jordan Oman Saudi Arabia Syrian Arab Rep. Yemen	Morocco

Source: UNICEF

Experience shows that the mobilization of both public demand and multisectoral resources to provide immunization are the key elements in achieving a rapid and sustainable increase in immunization coverage. Such mobilization is an important means of effectively energizing non-health sectors, such as education, the media and NGOs to make a permanent, ongoing contribution to advancing comprehensive PHC.

The countries which have undertaken acceleration of EPI programmes are given in table 1, and the immunization coverage for different regions is given in table 2. It should be noted that many countries (not mentioned in table 1) have ongoing programmes which have reached coverage of over 70 per cent, and will reach the goal through incremental increase.

There has been significant improvement in the last two years in several regions, especially in Africa. In addition, Turkey and the Syrian Arab Republic have both shown dramatic expansion in immunization coverage from low levels to above 70 per cent in 1986 in Turkey and above 60 per cent in the Syrian Arab Republic. This trend is likely to be more marked in the next two years when the acceleration begins to gain momentum and the outcome becomes more visible. Measles immunization coverage is generally lower because of its late introduction in many countries and also because of its scheduling (between the age of nine months now recommended by WHO and the traditional 15 months, thus not introduced in many countries before 12 months). The tetanus toxoid immunization rate remains low in all regions and deserves further attention and intensive efforts.

As a result of the significant momentum generated, many cities, provinces and countries achieved 80 per cent coverage in each of the six antigens during 1986. The countries which have achieved this objective are: Bahrain; Brunei; Chile; Costa Rica; Cuba; Cyprus; Dominica; Jordan; Lesotho; Palau; St. Kitts and Nevis; Samoa; Saudi Arabia; Seychelles; the Territory of Hong Kong; and Tonga.

The provinces/states and cities which have achieved this objective are: Kabul in Afghanistan; Hebei Province, Beijing, Shanghai and Tianjin in China; Pointe Noire in the Congo; Addis Ababa, Bale and Illubabor in Ethiopia; Goa Territory, Anantnag District, Alleppey, Kayamkulam and Shortallai in India; Hanover, Portland and Trelaway Provinces in Jamaica; Male in Maldives; Maputo in Mozambique; Abeokuta local government authority (LGA), Lagos

LGA and Owo LGA in Nigeria; Hargeisa and Mogadiscio in Somalia; the provinces of Mahasarakham, Nan, Phrae, Sigburi and Uttapradit, and Bangkok in Thailand; Beni and Tarija Departments in Trinidad; and Butawayi, Chitungwiza and Harare in Zimbabwe.

Many countries (e.g. Fiji and Sri Lanka) have also reached over 85 to 90 per cent coverage in all antigens except measles for children under one year of age.

The status of immunization coverage in the 25 countries with the largest infant populations (0-12 months) is given in table 3. However, it should be noted that the quality of the data is not always satisfactory, and the figures for most countries do not yet include the results of recent acceleration efforts. Unfortunately, the statistical data required for an adequate and up-to-date evaluation of progress of CSDR programme interventions are still not available for many countries. The statistical systems of many countries of the world still concentrate too narrowly on generating economic data to an extent which hampers efficient and effective policy making for children and women in general, and policy making in relation to CSDR in particular. Systems for statistical monitoring, reporting, publication and analysis need further strengthening.

Acceleration has also led to increased demand and supply of vaccines, as illustrated in table 4. The total vaccine supply has multiplied by three times during the last three years. It is estimated that vaccine requirements to meet the needs of immunization programmes in all developing countries will double between 1985 and 1988, and then drop by 1990 as the backlog of unimmunized children decreases sharply. Since there is adequate manufacturing and financial capacity to meet these requirements, no EPI programme in any country need stall for lack of vaccines now or in the immediate future.

WHO and UNICEF have conducted many joint coverage surveys and programme reviews since the commencement of EPI activities. Ninety-seven coverage surveys were completed between 1978 and mid-1986, most undertaken jointly. Up to 30 programme reviews are undertaken in one year. UNICEF began rapid assessments in 1984, and has completed 10 in eight countries. Most of the rapid assessments have been on accelerated EPI, but in the case of Ecuador, ORT, the promotion of breast-feeding and growth monitoring were included. In the Dominican Republic, the assessment included ORT and anti-parasitic treatment.

Due to major accelerated efforts, the impact of EPI is beginning

TABLE 2

Immunization coverage rates: 1981 and 1985 a/

REGION	Percentage of one-year-old children immunized against								Percentage of pregnant women immunized against	
	BCG		DPT b/		Polio b/		Measles b/		Tetanus	
	1981	1985	1981	1985	1981	1985	1981	1985	1981	1985
WORLD	48	48	33	43	31	43	24	35	--	--
INDUSTRIALIZED COUNTRIES	51	64	59	58	59	62	66	71	--	--
DEVELOPING COUNTRIES c/	47	44 d/	28	40	25	39	15	28	14	22
DEVELOPING REGIONS										
Africa	38	50	26	35	23	34	21	38	11	17
Africa, north of the Sahara	62	83	58	72	58	72	39	63	9	3
West Asia	44	39 d/	42	50	45	49	36	40	4	5

South and East Asia c/	49	36	25	38	12	34	3	14	16	25
East Asia c/	31	51	42	69	43	76	7	57	—	5
South-East Asia and the Pacific	55	62	17	35	14	36	2	25	9	22
Southern Asia	48	26 d/	26	37	9	30	3	7	19	27
Central and South America	57	65	41	53	74	69 e/	47	60	13 f/	22 f/

Source: WHO and UNICEF

a/ In the case of 13 developing countries (six in Africa, two in Asia and eight in the Americas), coverage rates prior to 1985 were used.
b/ In some countries, only two doses of DPT and polio vaccination are given, and measles vaccinations are given after 12 months of age.
c/ Excluding China. The latest estimates for immunization coverage in China, received by WHO, are as follows: BCG - 67 per cent; DPT - 74 per cent; polio - 84 per cent; and measles - 83 per cent.
d/ The drop in BCG coverage rates in developing countries is due to the fall in the official coverage estimates for India and Turkey between 1981 and 1985. Without these two countries, the developing countries' rates would be 40 and 52 per cent, West Asia rates would be 45 and 48 per cent, and the South Asia rates would be 9 and 31 per cent, respectively.
e/ The drop in polio coverage rates in Central and South America is due to the fall in the official estimates for Brazil and Mexico between 1981 and 1985. Without these two countries, the regional rates would be 46 and 58 per cent respectively.
f/ Represents 12 countries, excluding Brazil and Mexico. Also excludes Argentina, Chile and Uruguay, where the Ministries of Health say that tetanus toxoid is not required.

TABLE 3

Estimated immunization coverage in 25 developing countries a/

Country	New-borns surviving to one year of age (Millions)	Cumulative percentage of births	Percentage immunization coverage				
			Children under one year of age				Pregnant women
			BCG	DPT III	Polio III	Measles	Tetanus II
1. India (5)	22.60	27	24	44	35	—	37
2. Indonesia (5)	4.62	33	68	16	14	16	26
3. Nigeria (5)	4.29	38	12	7	6	6	—
4. Pakistan (5)	3.64	42	41	30	30	23	9
5. Bangladesh (5)	3.05	46	3	2	2	1	3
6. Brazil (5)	2.63	49	58	62	86	63	—
7. Mexico (5)	2.53	52	16	40	67	64	—
8. Islamic Republic of Iran (5)	2.17	55	64	51	51	51	18
9. Viet Nam (5)	1.72	57	42	29	25	10	—
10. Philippines (5)	1.69	59	76	59	61	55	55
11. Egypt (5)	1.56	61	84	95	95	74	8
12. Ethiopia (4)	1.55	62	14	8	8	16	4
13. Turkey (5S) b/	1.46	64	50	67	67	72	—
14. Zaire (5)	1.35	66	—	37	—	40	50
15. Burma (5)	1.34	67	22	8	1	—	13
16. South Africa	1.15	69	—	—	—	—	—
17. Thailand (5)	1.05	70	79	61	62	29	46
18. Kenya (3S)	1.04	71	76	58	57	55	—
19. United Republic of Tanzania (4)	1.00	73	73	52	49	63	32
20. Morocco (4)	0.95	74	67	46	46	40	—
21. Republic of Korea (4)	0.93	75	47	76	80	89	—

22. Colombia (5)	0.89	76	62	61	62	53	6
23. Sudan (4)	0.88	77	12	8	8	6	4
24. Algeria (1)	0.85	78	59	33	30	17	—
25. Argentina (5)	0.71	79	89	63	69	67	—
25 countries	65.66	79	36	38	36	22	20
Other developing countries	17.65	3	49	38	37	35	20
Subtotal developing countries (excluding China)	83.31	82	39	38	36	25	20
China (5S)	17.99	18	67	74 c/	84	83	—
Total developing countries (including China)	101.30	100	44	44	44	35	16
Total industrialized countries	17.36		56	62	66	76	0
Global total	118.66		46	47	48	41	14

Source: WHO

a/ Countries are ranked by number of infants surviving to one year of age based on data available as of August 1986.
b/ Government of Turkey announced that at end-1986, it had achieved over 80 per cent coverage of under-ones in all six antigens. Surveys are now being conducted.
c/ Two doses only.

Note: (1) 1981 coverage data. (3) 1983 coverage data. (5) 1985 coverage data.
(2) 1982 coverage data. (4) 1984 coverage data. (S) Survey data.

TABLE 4

UNIPAC supply of vaccines, 1982-1986

Vaccines	1982	1983	1984	1985 a/	1986 (est.)	Percentage increase 1982-1986
			(Millions of doses)			
BCG	35.7	35.7	46.7	69.0	82.0	229.7
DPT	30.0	43.0	63.9	93.4	120.0	400.0
DT	4.0	7.7	27.3	20.9	18.0	450.0
Polio	24.0	26.4	80.5	119.1	145.0	604.2
Measles	9.0	11.4	27.7	36.4	64.0	771.1
TT	22.0	23.1	30.5	38.0	65.0	295.5
Total	124.7	147.3	276.6	376.8	494.0	395.0

Source: UNICEF and WHO

a/ The UNIPAC supply represented about three quarters of the developing world total in 1985.

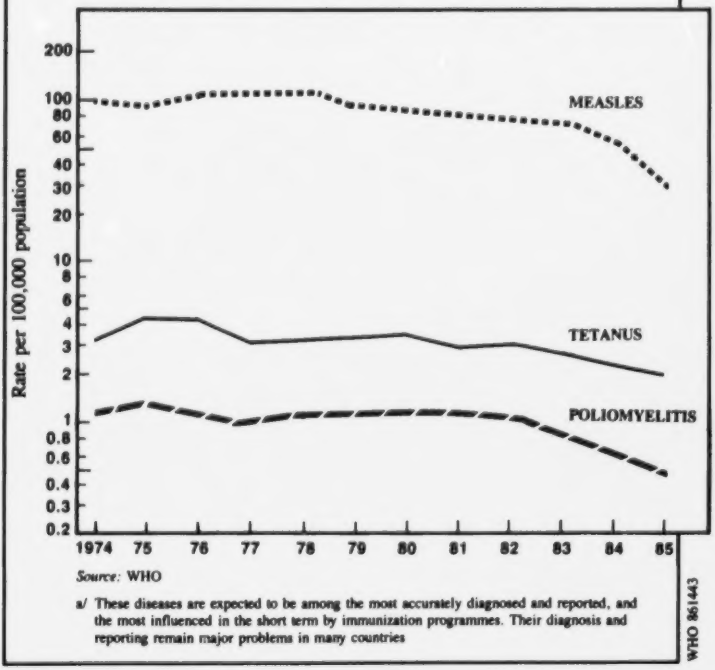
to be felt, and the declining trend can be observed in figure I on the reported global incidence of measles, tetanus and poliomyelitis in 1974-1985. It is noticeable that the declining trend which levelled off during the 1970s has become sharper since 1982-1983. The graphs are plotted on a logarithmic scale, thereby visually understating the proportional reductions in disease incidence. What they show, in fact, is a dramatic reduction in the incidence of all these diseases over the three years following 1982: by over 60 per cent for measles; by over 30 per cent for tetanus; and by some 60 per cent for polio. Significant reductions in the incidence of immunizable diseases in selected countries is presented in table 5.

On the other hand, a resurgence of reported poliomyelitis cases has taken place in the Americas, especially in Brazil, Colombia and Guatemala, as shown in table 6. It is likely that these figures reflect the detection of previously unreported cases through improved surveillance, but they may also reflect a drop in coverage, especially in Brazil, thus indicating the continued need for vigilance.

An analysis of recent experience shows some major operational issues in accelerated EPI programmes which need to receive constant attention. These include sustainability; programme linkages with immunization as the leading edge of PHC; costs and financing; the target coverage needed to attain 'herd immunity'; reaching the unreached; and the selection of injection equipment.

FIGURE I

Reported global incidence of measles, tetanus and poliomyelitis (per 100,000 population), 1974-1985 a/



Source: WHO

a/ These diseases are expected to be among the most accurately diagnosed and reported, and the most influenced in the short term by immunization programmes. Their diagnosis and reporting remain major problems in many countries

WHO 861443

Sustainability

It is important that programmes are technically and managerially sustainable and financially viable. UNICEF has promoted the co-ordinated support of immunization campaigns and infrastructure development which are complementary and mutually reinforcing when combined with a broad strategy of social mobilization. Experience indicates that before campaign momentum subsides, systems should be established or strengthened to carry on the activities.

TABLE 5

Reduction of incidence of immunizable diseases (per 100,000 population)

SICHUAN, CHINA

Diseases	1981	1984	Percentage reduction 1981-1984
Diphtheria	1.25	0.57	54
Pertussis	37.52	12.08	68
Measles	123.65	81.18	34
Polio	0.07	0.03	57

Source: Ministry of Public Health, China

SRI LANKA

Diseases	1978		1984		Percentage reduction 1978-1984
	Cases	Rate	Cases	Rate	
Polio	153	1.0	16	0.1	90
Diphtheria	216	1.5	17	0.1	93
Tetanus	2028	14.2	292	2.5	82
Neonatal tetanus	874	21.7	84	19.2	12
Pertussis	703	4.9	201	1.3	73
Tuberculosis	6360	44.8	6000	38.0	15

Source: Ministry of Health, Sri Lanka

ADDIS ABABA, ETHIOPIA

Diseases	1984	1985	1986	Percentage reduction 1984-1986
Pertussis	1204	602	82	93
Measles	812	2016 a/	191	76
Tetanus	165	112	80	52

Source: Office of the Mayor, Addis Ababa, Ethiopia
a/ Due to an epidemic

TABLE 6

Reported cases of poliomyelitis in the Americas

Country	1980	1985	1986
Argentina	41	2	—
Belize	3	—	7
Bolivia	48	—	—
Brazil	1290	461	657
Canada	—	1	—
Chile	—	—	—
Colombia	129	36	75
Costa Rica	—	—	—
Cuba	—	—	—
Dominican Republic	148	—	1
Ecuador	11	—	11
El Salvador	55	10	9
Guatemala	287	29	39
Haiti	20	90	33
Honduras	3	4	4
Mexico	682	148	76
Nicaragua	21	—	—
Panama	—	—	—
Paraguay	7	3	—
Peru	182	67	42
United States	9	5	1
Uruguay	—	—	—
Venezuela	11	8	2
Total	2947	864	957

Source: Monthly reports of the Immunization Unit, Pan American Health Organization, Washington, D.C.

Programme linkages with primary health care

Immunization is part of public health as well as of preventive child health care. Therefore, it is likely to be better sustained financially as well as operationally if it is part of the PHC system of a country, not to mention the accrued benefits of synergism. It is, therefore, essential that immunization be implemented as part of the PHC system, or that it lead to its establishment or strengthening.

Costs, financing and external support

The global challenge of UCI/1990 has generated extensive external support, particularly from the Governments of Canada, Italy, Norway,

Sweden and the United States, as well as Rotary International and elsewhere. Total commitments to date have exceeded US$100 million. Efforts are being made by UNICEF and other donors, in collaboration with governments, to gain more complete knowledge about the costs of immunization services under different circumstances and using different approaches so as to arrive at a more complete understanding of the full financial implications of achieving the goal. Over the longer term, mechanisms for promoting country financing of ongoing programmes must be strengthened.

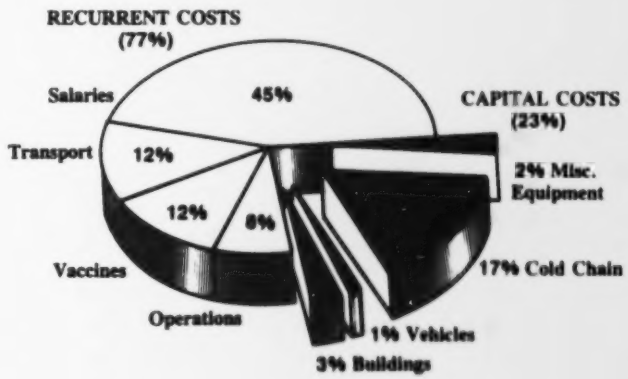
Evidence has been gathered on the cost-effectiveness of immunization in over 25 countries, including data on accelerated activities in Burkina Faso, Colombia, Nigeria and Turkey. Costs vary widely, depending on the type of strategy, scale of operation and content of the immunization package, and are often not directly comparable among countries due to different methods of evaluation and data limitations. With these qualifications in mind, the average cost per fully immunized child has ranged from under US$5 to over US$25 for routine strategies, and from under US$5 to, in one case, over US$50 for an intensive campaign. In a study in Mauritania, which compared the costs of different strategies within a single country, per-child costs were US$7 for fixed centres, US$9 for national vaccination days and US$17 for mobile teams.

Those figures compute the monetary value of immunization inputs, including donated services and volunteers' time. Actual financial outlays are thus considerably lower, particularly for an intensive campaign. The somewhat higher costs of campaigns than for fixed (though not always mobile) strategies are due to the need for special activities, the difficulties of reaching marginal population groups and the higher level of non-financial inputs generated by social mobilization during the campaigns. In Turkey, the cost of immunizing four million children in 1985 was US$29 million, and the campaign increased the proportion of children covered from about 25 per cent to over 80 per cent. The inputs consisted of US$4 million in cash outlays (US$2.5 million from UNICEF and other external sources and US$1.5 million from the Ministry of Health), while the remaining US$25 million represented donated time and services from television and radio, private organizations and branches of Government other than the Ministry of Health, including the time of the President, Prime Minister and Provincial Governors.

The breakdown of costs of immunizing a child also varies among

FIGURE II

Breakdown of costs for a fully immunized child (in routine strategies)



Source: Foege, W.F. 'Protecting the World's Children: Strategies for Attaining the Goal', in *Protecting the World's Children*, Report on the Bellagio Conference, 13-15 March (The Rockefeller Foundation, June 1984), pp. 83-116

programmes, but in general there is evidence that long-term immunization services are affordable. A review of the distribution of costs for 11 evaluated EPI programmes shows that on average vaccines account for 12 per cent, cold chain and vehicles for 18 per cent and salaries of health personnel represent 45 per cent of the total (see figure II).

Evidence from accelerated programmes indicates that the cost of salaries—the highest routine expense—is much lower where strong community participation and donated services from the private sector and national NGOs are a key feature of the campaign (e.g. Mauritania, where salaries comprised 35 per cent). External support is critical for vaccines, cold-chain equipment and vehicles, whose

purchase generally requires foreign exchange. These items total roughly 20 per cent of overall costs in routine programmes, and were estimated at 27 per cent of overall costs in the Mauritania campaign. Most countries can afford immunization acceleration if foreign exchange expenses are borne by external donors. In the poorer countries, however, especially those hard-hit by the economic crisis, assistance will have to continue well beyond 1990, and it may have to cover some recurrent expenses normally assumed by governments.

Preliminary evidence thus indicates that acceleration allows for the achievement of significant improvements in immunization coverage at affordable costs per child. It also points to ways in which productivity may be enhanced through improved management of the cold chain, human resources and other inputs, and through determination of the most appropriate mix of vaccination strategies. Increased attention is now being given to cost issues in the planning, monitoring and evaluation of immunization activities. This will promote greater responsiveness to the resource situation of different countries, and the sharing of this knowledge will help other countries identify resources for immunization and develop mechanisms for sustained financing of programmes.

Coverage target and 'herd immunity'

Although the term 'universal coverage' implies a total coverage of the target population, it is rare that the entire population is actually covered by any endeavour such as an immunization programme. There will always be a segment of the population that cannot be reached because of geographical isolation or other reasons.

The target coverage for 'universal' immunization is now variably fixed in different regions, for example 75 per cent in Africa and 85 per cent in China. The great majority of deaths and disabilities will, therefore, be prevented by 1990, but it is obviously desirable that, during the 1990s, the coverage would need to be not only sustained, but increased to over 90 per cent, especially where the incidence of malnutrition is higher.

Since the ultimate purpose of universal immunization is to eradicate such vaccine-preventable diseases as polio and measles (tetanus cannot be eradicated), the first step is to try and reach a state of 'herd immunity' in which the probability of a non-immunized child coming into contact with the disease is greatly reduced. This would

constitute minimum coverage for immunization, although it must be understood that immunity is not imparted to the non-immunized person who can still contract a disease if exposed to infection. The concept of 'herd immunity' is also not applicable for tetanus since the bacillus is not transmitted from person to person.

A study was made recently of the relationship between the transmission dynamics of infectious agents and 'herd immunity', which varies from disease to disease. They suggested that 92 to 96 per cent of children may need to be immunized to eliminate measles and pertussis, and naturally an even higher percentage of coverage would be desirable since it would further reduce the opportunities for infection.

Reaching the unreached

In most social programmes, there is a proportion of the target population that is never reached, but there are few studies which have identified the specific characteristics of these groups. The proportion is usually around 30 per cent, and is generally presumed to consist of socio-economically disadvantaged groups, or those people most in need. Moreover, it is interesting to note that even the best conventional immunization programmes reach a plateau at around 70 per cent coverage, as seen in Thailand. Although it is generally assumed that the unreached are in remote villages, recent statistics show that many are, in fact, in the cities.

In the Philippines, 1983 data showed that while most of the provinces had reached a two-dosage diphtheria/pertussis/tetanus (DPT II) coverage rate of over 70 per cent, Metro Manila had the lowest coverage at 38 per cent. This was even lower than the lowest recorded in central Mindanao, known to be the least developed region in the country. This picture was generally true for all antigens. During the 1985 campaign in Turkey, Ankara had a coverage rate of 54 per cent, Istanbul 71 per cent and Izmir 60 per cent, while 41 rural provinces had coverages of 90 per cent or more. Even assuming that there may have been earlier unrecorded immunizations before the campaign, coverage rates in cities still trailed behind those in rural areas. Elsewhere, there are exceptions to these findings. Bangkok, for example, has achieved an overall coverage rate of over 90 per cent. However, the dichotomy between city rates and rural rates indicates an area where further attention to tracing the unreached is needed.

Selection of injection equipment

In 1986, WHO and UNICEF issued joint guidelines for the selection of injection equipment for EPI. The guidelines take into account the need to minimize the risk that the use of non-sterile injection devices may contribute to the spread of serum-transmitted diseases and opportunities for cost-reduction created by technical advances. The guidelines accordingly recommended that one sterile needle and one sterile syringe should be used for each injection, and that, as a general rule, reusable needles and plastic syringes should be used in both routine and accelerated immunization activities. Steam sterilization was recommended as the preferred method.

These guidelines were widely distributed among UNICEF, WHO and governmental counterpart staff involved in immunization activities. The importance of their application is increased by the acquired immune deficiency syndrome (AIDS) pandemic, as the avoidance of AIDS transmission through the use of contaminated needles and syringes is an issue of vital importance on the contemporary international public health agenda. As a practical measure, UNICEF is now promoting the practice of storing and providing reusable syringes and needles at immunization contact points in quantities sufficient for each day's needs.

Concerns have been expressed regarding the spread of the AIDS virus (Human Immuno-deficiency Virus—HIV) among children and the implications for UNICEF. Studies from Africa have not to date found any link whatsoever between the spread of HIV and immunization. This is believed to reflect, at least in part, the emphasis placed on proper sterilization techniques in EPI programmes. Of greater concern is the prospect of infected mothers passing on the virus to new-born infants. This is becoming a serious problem in some countries and cities, and UNICEF is co-operating closely with WHO in all matters relating to this new threat to child health. At present, the main action appears to be educational programmes about safe sex.

2. Oral rehydration therapy

Diarrhoea is the main cause of death (more than 4.5 million in 1986) in children under five years of age in developing countries, and interacts adversely with malnutrition. UNICEF, together with WHO, has supported programmes for its prevention and control, and

TABLE 7

Global oral rehydration therapy targets and status

Indicator	1980	1982	Status	1983 target	1984 (est.)	1989 target	1995 target
Awareness of ORT and access to ORS (%) a/	< 1	6	21	25	36	80	95
ORT use (%) a/	< 1	1 b/	4 b/	12	13	50	70
Reduction in diarrhoea-related mortality (%)	0	—	3	—	7 c/	25 c/	50 c/
Number of diarrhoea-related deaths otherwise expected (millions)	5	—	5.3	—	5.4	6.0	6.8
Number of diarrhoea-related deaths averted (thousands)	—	—	140	—	380	1500	3400

Source: WHO

a/ Access to ORS is defined as the percentage of the population with reasonable access to a trained provider who can demonstrate its correct use, and who can maintain consistent supplies of ORS packets.
ORT use is defined as the percentage of acute diarrhoea episodes occurring in children under five years of age that are treated with appropriate home-available ORT or with ORS.

b/ ORS only.

c/ Assume 67 per cent of deaths prevented by ORT and 80 per cent effective use, to become 100 per cent by 1995.

CSDR has enabled support to make a quantum leap since 1982-1983. USAID has become a principal supporter through its Child Survival Programme. Currently, 85 countries have operational programmes, and UNICEF has co-operated in CDD in over 70 countries. In CDD programmes, UNICEF works in close partnership with WHO, whose role is concerned with the development of national programmes, the training of national-level managers and advice and research on technical matters. UNICEF is primarily responsible for: helping to produce and/or supply oral rehydration salts (ORS); training at subnational and community levels; and the development and use of multi-media information materials for social mobilization.

As a strategy for the management of diarrhoeal diseases, WHO and UNICEF promote the use of 'home-available' solutions such as rice

TABLE 8

Evolution of operational control of diarrhoeal diseases programmes

Region	1980	1981	1982	1983	1984	1985	1986
				(Number of countries)			
Africa	0	5	5	10	17	19	24
Americas	2	8	11	13	20	22	22
Asia	5	9	16	21	24	25	25
Middle East and North Africa	1	2	5	8	14	14	14
Total	8	24	37	52	75	80	85

Source: WHO/CDD/86.16 and UNICEF Annual Reports

TABLE 9

Supply of oral rehydration salts, 1982-1985

Source	1982	1983	1984	1985
		(Million litres equivalent)		
UNIPAC	17	28	60	87
Other international sources	—	9	9	26
Commercial imports	—	11	24	20
Local production	41	63	84	137
Total	58	111	177	270

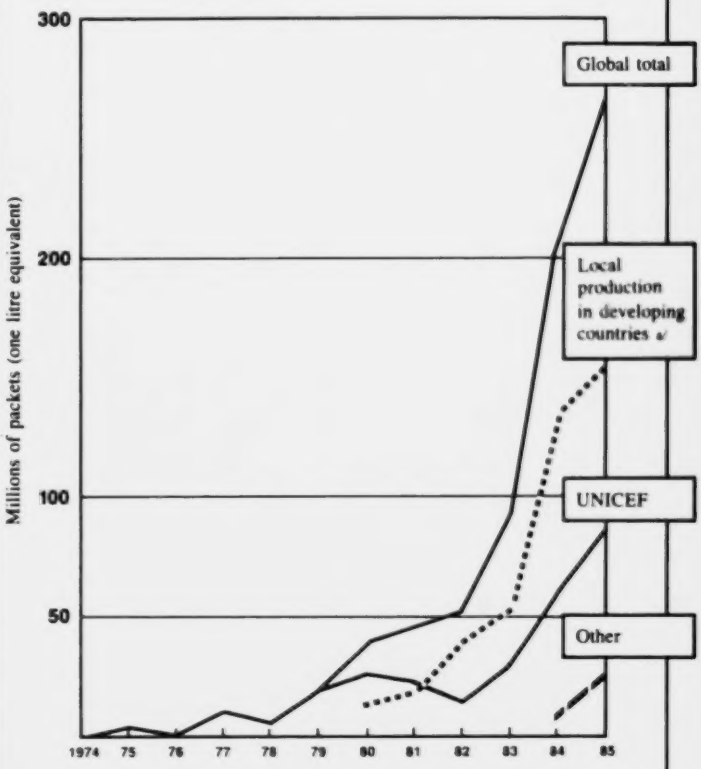
Source: UNIPAC

liquids, vegetable soups, or sugar and salt solutions in water to *prevent* dehydration as a consequence of diarrhoea, and the use of prepacked ORS to *treat* dehydration when it does occur. Together with WHO, UNICEF is now working towards the joint targets set for 1989—universal awareness, 80 per cent accessibility and 50 per cent use of ORT world-wide. The evolution of global ORT targets and status is given in table 7, and the status of operational programmes in table 8.

The global supply of ORS being sent by the UNICEF Procurement and Assembly Centre at Copenhagen (UNIPAC) to expanding national CDD programmes has increased by over five times since the advent of CSDR (table 9), and the growth of global ORS supply, increased

FIGURE III

Global supply of oral rehydration salts packets, 1975-1985

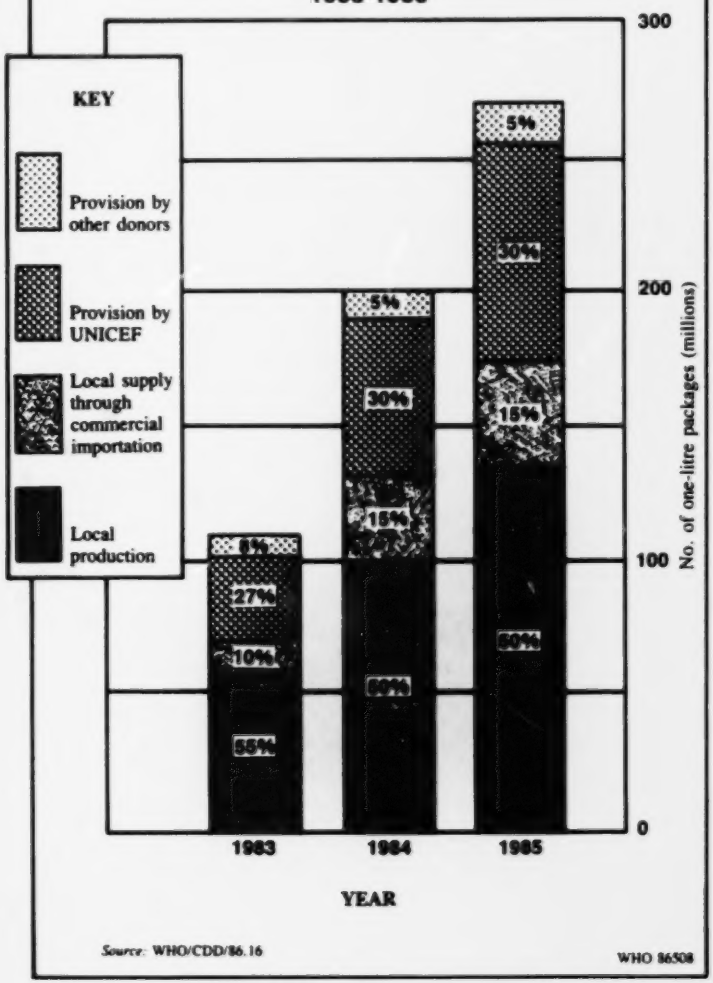


Source: UNICEF

a/ Many of these countries receive support from UNICEF and WHO

FIGURE IV

Global supply of oral rehydration salts, 1983-1985



from one million sachets in 1975 to 270 million sachets in 1985 (figure III). The proportions between local production, UNICEF supply and local commercial supply appear to have stabilized in recent years (figure IV).

Diarrhoeal diseases are not only the major killers of children under five years old, but are also the source of unnecessary annual expenditures of as much as US$600 million in developing countries. This is the result of the widespread use or misuse of anti-diarrhoeal drugs. It is hoped that successful ORT programmes will not only prevent unnecessary deaths and reduce occupancy of hospital beds, but will also allow substantial savings to be made in health service expenditures and in the cost of treatment to the consumer.

While some physicians (a declining proportion) still resist ORT as the optimal anti-diarrhoeal dehydration therapy, a more important issue is the gap between public knowledge about, and actual use of ORT. Studies in both Bangladesh and Egypt revealed that one third of those who knew about ORT had not used it during the most recent bout of diarrhoea in their children.

In some country programmes (e.g. Nigeria), mutually supportive programme linkages between diarrhoeal and other disease control programmes have been established. At the moment, the promotion of ORT seems to be the strongest element of disease control programmes. ORT promotion needs to be linked with measles immunization, breast-feeding, food and personal hygiene (especially hand washing), and water and sanitation projects. Among the many important communication channels for disease control promotion, schools are seen as good sources of dissemination of information to parents.

3. Growth monitoring and promotion

Although it is universally recognized that monitoring the growth of a small child is an effective way of measuring health status and detecting the early, otherwise invisible, stages of malnutrition, the adoption of this CSDR intervention on a wide scale has proved to be slow moving. Difficulties in its promotion have been compounded by the multiplicity of scales and growth charts used by different agencies, which has generated confusion among health workers. In many programmes, weighing children has become an end in itself with little follow-up among mothers whose children's growth is falter-

ing. Few health workers are equipped to advise mothers on nutrition, and in many instances, systems of referral are also lacking.

In addition to its preventive objectives, growth monitoring provides the setting for a change in health behaviour. It enables mothers to be in regular contact with health workers instead of only when the child is ill. This opportunity encourages the internalization of preventive behaviour and a different attitude towards the utilization of health services, which can be built upon to introduce mothers to other health-promotive actions.

In order to review the concept and experience of growth monitoring, UNICEF organized two consultations—one in April 1985 in New York and another in May 1986 in New Delhi. A consensus was reached concerning the significance of child growth as a factor in health and child development and the need to extend growth monitoring more widely. The current problems, such as scale technology, the proliferation of growth charts and inadequate responses to growth faltering were discussed, and the need for operations research to find solutions to these problems was recognized.

It was agreed that UNICEF and other concerned organizations should support the growth monitoring and promotion strategy as a means of improving the chances of survival of each individual child, linking mother and child to the PHC system, targeting other elements of PHC to women and children, and facilitating universal coverage of growth monitoring.

4. Breast-feeding and infant and young child feeding

The nutrition of infants and young children remains an enduring UNICEF concern because the incidence of malnutrition has not dropped significantly in many developing countries. The promotion of breast-feeding remains critical because the pressures of modern city life and the increasing necessity for women to work away from home tend to reinforce its decline. The actions of WHO, UNICEF and many NGOs led to the adoption of the International Code of Marketing of Breastmilk Substitutes in 1981. Since then, many countries have adopted measures to protect breast-feeding and to control commercial advertising of breast-milk substitutes.

WHO and UNICEF, together with the Commonwealth Secretariat, have developed action plans for follow-up on the Code. WHO and UNICEF have also issued guidelines on hospital practices to support

TABLE 10

Number of countries that have taken action in relation to the International Code of Marketing of Breastmilk Substitutes a/

Region	1982	1983	1984	1986
Africa	14	16	15	4
Americas	16	11	11	5
Eastern Mediterranean	—	—	—	—
Europe	14	22	10	9
Asia and the Pacific	23	14	10	16

Source: WHO

a/ The list indicates countries taking action(s) in each year. Therefore, some countries are counted more than once in the list, in different years.

breast-feeding. Many countries have made progress in this area by training health personnel to support breast-feeding and by imparting knowledge of its mother/child bonding, anti-infective and contraceptive attributes.

Table 10 shows the number of countries that have taken action in relation to the International Code of Marketing of Breastmilk Substitutes.

WHO and UNICEF sponsored a consultation in 1985 to clarify the circumstances under which a mother cannot breast-feed, and to recommend appropriate action. While breast-feeding is now on the increase among mothers in industrialized countries, the situation has not significantly improved in developing countries. Although the breast-feeding rate remains high in most rural areas, there is a decline in many urban areas. This is due mainly to the need for better social support for breast-feeding mothers, but the adoption of the Code in more countries still needs to be pursued. In others, existing legislation needs to be strengthened since many national codes are significantly diluted versions of the internationally recommended Code. In addition, intensified work on the Code and its provisions can serve as a good entry point to other areas of importance in infant and young child nutrition.

In many developing countries, the nutritional problems at the stage when complementary food starts to be given are even more important than the promotion of breast-feeding. Many mothers are ignorant of appropriate feeding practices, and face many practical difficulties

in frequent feeding and in maintaining cleanliness. Poor food and poor utensil hygiene lead to frequent bouts of diarrhoea, starting the downward spiral towards serious malnutrition.

UNICEF has worked in this area for decades. Experience in supporting the industrial preparation of weaning foods has long shown that, except in special circumstances, this is not the optimal approach. Most processed weaning foods are outside the financial range of the poor and are unavailable outside of cities.

For the weaning period, UNICEF now promotes the preparation and use of locally available, energy-dense and protein-rich food (e.g. peanuts, beans or palm oil in several West African countries), more frequent feeding and the avoidance of food which has been cooked for some time and may already be spoiled. However, the preparation of hot (and therefore bacteria-free) food presupposes the availability of fuel and cooking time, both of which are scarce in poor communities. UNICEF is promoting group day care in many countries so that children can be fed together on a regular basis, while mothers are out working in the field (e.g. Burkina Faso). The importance of empowering parents through education cannot be over-stressed.

5. Family food security

In its early years, UNICEF was actively involved in supplementary feeding programmes, but since the establishment of the World Food Programme, its role in this context has been reduced to selective feeding in emergency relief programmes. Food is an important dimension of nutrition, and its effective use and availability depend not only on its production, but also on its distribution and on knowledge of its nutritional properties. The lack of food security in many socially disadvantaged households has become an acute problem, especially in Africa (see *Within Human Reach* and other reports). UNICEF is now engaged in certain countries (the Central African Republic, Nigeria, Rwanda and the United Republic of Tanzania) in projects designed to address the many dimensions of the problem, in close collaboration with the International Institute of Tropical Agriculture, Ibadan, Nigeria (see also the Executive Director's report, E/ICEF/1987/2).

Lack of food in the household is usually not due to an overall shortage of food in the country, but arises from the maldistribution

of food, exacerbated by the lack of purchasing power in needy families. In a small area of Ethiopia in 1984, cash payments in the form of wages for labour on public works were given to villagers in drought areas, which enabled them to buy food from food surplus areas. Since droughts are cyclical in nature and not always prolonged, this approach pre-empted the migration of the affected population to welfare camps, the suspension of their existing community living patterns and their subsequent need for resettlement. It should, however, be noted that such projects are not likely to be successful where environmental conditions have deteriorated to a point of desertification that even the return of rain cannot alleviate.

6. Micro-nutrient deficiencies

UNICEF has long been involved in programmes to combat the three most common micro-nutrient deficiencies—iron, vitamin A and iodine. Work on iron deficiency anaemia remains weak, although it is a serious problem for pregnant women. The situation is severe in the sub-continent of South Asia and in Africa, where it is exacerbated by malaria. Although UNICEF actively promotes and supports the distribution of iron and folate to pregnant women through the PHC/MCH system, they are not very acceptable. WHO and UNICEF are co-operating to find new affordable solutions.

Vitamin A deficiency is widespread in many regions. WHO has identified 34 countries where vitamin A deficiency causes sufficient sight impairment and blindness to be considered significant in public health terms, and an additional 23 countries where the prevalence of vitamin A deficiency needs close monitoring. Following the formulation in the 1970s of the megadose vitamin A capsule (200,000 I.U.), which needs to be taken only every four to six months, UNICEF became the major supplier of vitamin A capsules for xerophthalmia control and prevention. The supply of capsules increased from three to 80 million from 1981 to 1985 (see table 11). Most of the increased volume went to Bangladesh and Indonesia, which together received 80 per cent of all vitamin A supplies from UNIPAC. Current procurement approximates 21 per cent of projected demands for the prevention of xerophthalmia, which indicates that there are still considerable unmet needs.

The recent surge of interest in vitamin A was generated by research findings showing that its deficiency increases morbidity and mortality

TABLE 11

UNIPAC supplies of vitamin A (200,000 I.U.)

Region	1981	1985
	(In millions)	
East Asia and Pakistan	2.8	66.3
South Central Asia	—	2.2
West and Central Africa	0.3	6.5
Eastern and Southern Africa	—	2.1
Middle East and North Africa	—	2.1
Americas and the Caribbean	—	1.3
Total	3.1	80.5

Source: UNICEF

in young children from diarrhoeal diseases, ARI and measles. These findings are now being reconfirmed, and if vindicated, will throw a new perspective on the epidemiology of vitamin A deficiency. Programmes to increase childhood intake of vitamin A will need to be accelerated not only to prevent blindness, but also to improve resistance to other infections. Therefore, during 1986, UNICEF reviewed its support for combating vitamin A deficiency in many countries. The intention is to reformulate programme strategies using a two-pronged approach: improved nutrient intake through home gardens and nutrition education; and continued supplies of vitamin A in megadose form where appropriate.

Epidemiological studies in the past few years have shown that in addition to endemic goitre and cretinism, iodine deficiency may also contribute to foetal wastage, deaf-mutism, neonatal mortality, permanent neuromotor impairment and general mental retardation. It is estimated that iodine deficiency disorders currently affect more than 500 million people in the world, and cretinism affects about three million. More than 50 per cent of these live in South-East Asia and more than 80 per cent in Asia as a whole, but there are also important affected areas in Latin America and Africa.

UNICEF has been involved in assistance to several countries in iodine deficiency studies and control programmes (e.g. Bhutan, Bolivia, India, Indonesia, Nepal, Pakistan and Peru). UNICEF has also been a principal supporter of the recently formed International

Consultative Council on Iodine Deficiency Disorders aimed at mobilizing world opinion and increasing knowledge about the epidemiology and control of these disorders. The control of iodine deficiency is usually addressed by the iodization of the local salt supply, but in isolated areas where the problem is serious, therapy is by the injection of iodized oil. UNICEF support has now been enlarged to all regions, since surveys have indicated the prevalence of iodine deficiency disorders to be more widespread than previously supposed.

7. Family (birth) spacing

Family (birth) spacing is integral to CSDR because of the critical need to protect the health and well-being of the mother and her children, and because of the close relationship between fertility reduction and mortality reduction, which increases the potential contribution of an increase in CSDR strategies slowing population growth. Currently, 70 out of 134 developing countries have policies for the reduction of population growth rates or for advocating birth spacing, and 93 per cent of the population live in countries interested in child spacing. Concurrently, the problem of teenage pregnancy has emerged as a major issue, especially in Africa, the Caribbean and Latin America.

UNICEF works closely with WHO and the United Nations Fund for Population Activities (UNFPA) to help the prevention of 'too young, too old, too frequent and too many' pregnancies through MCH services and training in responsible parenthood. The specific UNICEF programme emphasis is on advocacy and on training personnel in health and other child-related services. In 1986, new programming guidelines were issued, and in 1987, UNICEF, WHO, UNFPA, International Planned Parenthood Federation, the World Bank and the Population Council will be sponsoring an international conference on the health benefits of birth spacing. UNICEF intends to strengthen its activities in this area, especially through advocacy of birth spacing as an element of MCH and in training programmes.

Concerns have been expressed that the success of CSDR will contribute towards population increase in developing countries, with macro-economic and other demographic implications. Successive reports on *The State of the World's Children* (1985-1987) have addressed this issue and may be consulted. Historically, all countries

that have lowered their birth rates did so only after lowering their death rates.

In any case, it would be ethically unacceptable and unconscionable to allow any children to die, especially if low-cost and affordable means are available to save their lives. Besides, no birth spacing or population programmes can really succeed if parents cannot be assured that the children born to them will survive. In this connection, the address given by the late Indian Prime Minister Indira Gandhi to the Asian Parliamentarian Conference on Population in New Delhi in 1984, may be relevant:

> "Parents are more likely to restrict their families if they have reasonable assurance of the healthy survival of two children. The prevention and cure of childhood diseases thus acquires special importance."

8. Women's education

Despite the well-documented connection between the educational level of mothers and their children's prospects for survival and development, the low rates of female literacy in many countries remain alarming (see table 12). Countries with a high IMR are also countries with high female illiteracy (see table 13). There are still wide disparities between boys' and girls' enrolment in primary school, and between male and female literacy. Therefore, heightened attention is being given to women's education in all relevant UNICEF country programmes of co-operation. The time is ripe for the extensive use of social mobilization and communication for education, as in Burma and the United Republic of Tanzania, in order to reach national coverage in educational outreach.

9. Emerging related concerns of the child survival and development revolution

Although the order of importance varies from country to country, the main cause of infant and child deaths in developing countries are diarrhoea, immunizable diseases (especially neonatal tetanus and measles), ARI, malaria and low birth weight associated with maternal malnutrition. While most country programmes at present include CDD and EPI, other elements are likely to be present since country

TABLE 12

Countries with the highest female illiteracy rates, and the disparity between male and female illiteracy a/

Rank	Country b/	Female illiteracy rate	Female illiteracy rate as a percentage of male illiteracy rate
1.	Yemen	97	133
2.	Burkina Faso	94	119
3.	Somalia	94	115
4.	Afghanistan	92	151
5.	Niger	91	112
6.	Chad	89	148
7.	Mali	89	116
8.	Nepal	88	144
9.	Saudi Arabia	88	135
10.	Gambia	85	115
11.	Benin	84	133
12.	Guinea	83	138
13.	Guinea-Bissau	83	153
14.	Pakistan	81	135
15.	Senegal	81	129
16.	Sierra Leone	79	127
17.	Sudan	79	134
18.	Bangladesh	78	137
19.	Morocco	78	142
20.	Mozambique	78	173

Source: UNESCO

a/ Circa 1985.

b/ Other countries with high illiteracy rates are excluded because of lack of reliable data. They include: Angola, Bhutan, Djibouti, Mauritania and Oman.

programmes are generally the product of interaction between a country's priority needs and organizational priorities (see also the report on programme priorities and focus in UNICEF programmes of co-operation, E/ICEF/1987/L.4).

ARI programmes have been slow to develop because the medical profession is generally reluctant to entrust the prescription of antibiotic drugs to community-level workers. Where this is allowed, better training is needed, as people tend to take the drugs for fewer days than required, thus building up unnecessary drug resistance.

Many malaria control programmes continue to emphasize the use of insecticides for vector control and prophylaxis for children. The new approach promoted by WHO and UNICEF encourages prophylac-

TABLE 13

List of countries showing relationship between infant mortality rates and female literacy a/

Infant mortality rates (1975-1980)	Female literacy levels (1980)				
	Very low (15% and under)	Low (16-30%)	Middle (31-50%)	High (51-80%)	Very high (over 80%)
Extremely high (150 and over)	Afghanistan Benin Burkina Faso Chad Ethiopia Gambia Guinea Guinea-Bissau Mali Nepal Niger Senegal Somalia Yemen	Angola Central African Republic Democratic Yemen Liberia Malawi Sierra Leone	Kampuchea		
Subtotal: (21)	**(14)**	**(6)**	**(1)**		
Very high (100-149)	Saudi Arabia	Bangladesh Burundi Cotê d'Ivoire Haiti Egypt India Morocco Mozambique Nigeria Pakistan Papua New Guinea Sudan Togo	Algeria Cameroon Congo Gabon Ghana Iran Libyan Arab Jamahiriya Rwanda Tunisia Uganda Zaire	Bolivia Lao People's Democratic Republic Swaziland United Republic of Tanzania Turkey Zambia	Lesotho
Subtotal: (32)	**(1)**	**(13)**	**(11)**	**(6)**	**(1)**

TABLE 13

List of countries showing relationship between infant mortality rates and female literacy a/

Infant mortality rates (1975-1980)	Female literacy levels (1980)				
	Very low (15% and under)	**Low** (16-30%)	**Middle** (31-50%)	**High** (51-80%)	**Very high** (over 80%)
High (50-99)			Cape Verde Guatemala Kenya Syrian Arab Republic United Arab Emirates	Bahrain Botswana Brazil Dominican Republic Ecuador El Salvador Honduras Indonesia Iraq Jordan Madagascar Nicaragua Peru Zimbabwe	Colombia Mexico Mongolia Philippines Thailand
Subtotal: (24)			**(5)**	**(14)**	**(5)**
Middle and low (less than 50)				Fiji Kuwait Lebanon Malaysia Mauritius Singapore Sri Lanka Suriname Territory of Hong Kong	Argentina Barbados Chile Costa Rica Cuba Cyprus Guyana Jamaica Panama Paraguay Republic of Korea Trinidad and Tobago Uruguay Venezuela
Subtotal: (23)				**(9)**	**(14)**
Total: (100)	**(15)**	**(19)**	**(17)**	**(29)**	**(20)**

Sources: Female literacy: UNESCO Office of Statistics
Infant mortality rates: United Nations Population Division

a/ The following countries are not included because of the absence of data: Belize; Bhutan; Burma; China; Comoros; Djibouti; Equatorial Guinea; Democratic Republic of Korea; Maldives; Mauritania; Namibia; Oman; Qatar; Sao Tome and Principe; Samoa; Seychelles; Viet Nam; various Pacific and Caribbean Islands and all developed countries.

tic intake of anti-malarial drugs only by pregnant women. Children living in areas with malaria who develop fever should be given anti-malarial drugs as a safety precaution, but not as a preventive. This approach has been outlined in a joint WHO/UNICEF statement, but it is not yet generally known and needs to be promoted.

Essential drugs constitute an essential component of PHC, and UNICEF has been providing assistance to governments in their acquisition, storage, distribution and correct utilization since 1978. However, in recent years, economic hardship has led to dire shortages in the drug supplies of many developing countries, with some surviving on two months' normal supply in a year and restricting their use to city hospitals. The positive aspect of hardship is that over 80 developing countries have now changed their drugs procurement policies and have initiated essential drugs programmes.

Experience has shown that no more than 30 to 40 essential drugs at a cost of less than US$1.00 per capita per year, and in some countries even US$0.50 , are needed to meet PHC needs. This cost factor in health service delivery is important in relation to its sustainability without prolonged external support. UNICEF has been able to deploy its experience in international purchasing to obtain drug supplies on the world market at competitive prices. UNICEF also forwards to governments information concerning prices from potential suppliers so that they can negotiate better their own procurement, or avail themselves of reimbursable procurement through UNICEF. The value of essential drugs and vaccines supplied by UNIPAC rose from US$12 million in 1982 to US$37.6 million in 1985.

The essential drugs programme is a most significant element of PHC. The Executive Board has approved a scheme to enable needy developing countries to pay for reimbursable purchases on delivery, rather than when ordering in advance, as in the past. Several donors have expressed interest in supporting this scheme, and the first contribution of US$4 million has now been made by the Government of the Netherlands.

Prospects

Although the goal of UCI/1990 looked unattainable three years ago, it now appears realizable if present progress is maintained and strengthened. The 30 most populous countries in the developing world contain 88 per cent of the population under one year of age, and all these countries have now accelerated their EPI programmes or have already reached high coverage. Combined with other accelerated efforts in smaller countries, the results in these countries should enable the goal of 80 to 85 per cent of children under one year to be achieved globally for all antigens. The phase of consolidation over the following five years will hopefully raise coverage to 90 per cent or over, meaning that regular health services alone could accommodate new-borns after 1995. In 1986, WHO estimated the number of deaths prevented now at 177,000 for tetanus, 245,000 for pertussis and 541,000 for measles—a total of 963,000 for all developing countries (WHO/EPI/GAG/86/WP.1).

The Third United Nations Development Decade has set infant mortality goals for 1990 at a maximum of 120 or less per 1,000 live births. The aim for the end of the century is 50 or less. The UNICEF medium-term plan for 1985-1989 adopted these goals and set a target of an under-five mortality rate (U5MR) of 70 or less per 1,000 live births by the year 2000.

In 1982, the United Nations Population Office indicated, in *World Population Prospects*, that on the basis of past trends, of the 160 countries or territories for which IMR had been projected, 69 countries were not expected to reach the year 2000 goal. Of these 69 countries, 47 are in Africa, three in Latin America, 18 in South Asia and one in Oceania. If ways could be found for all countries to reduce IMR to 50 or less per 1,000 live births and U5MR to 70 or less, there would be 11.3 million fewer deaths of children under-five annually. Major attention needs to be paid to sub-Saharan Africa and to a few countries in the Middle East, North Africa and South Central Asia.

The major CSDR interventions which would contribute to this

saving of 11.3 million lives per year include CDD, EPI, ARI, malaria control, birth spacing and the improvement of maternal, infant and young child nutrition through social mobilization in the context of strengthened PHC structures.

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